



*The wise choice for* **U**ltra **R**eliable **B**earings

**URB GROUP**

## **URB ELECTRICALLY INSULATED CYLINDRICAL ROLLER BEARINGS**



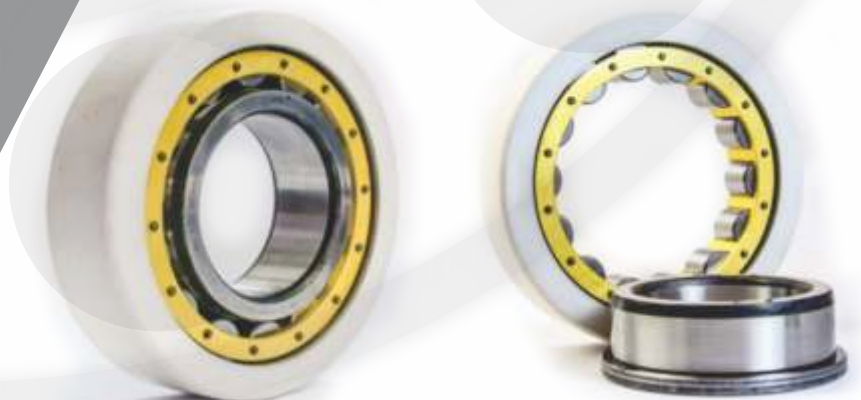
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## Electrically Insulated Cylindrical Roller Bearings

### SQ11 & SQ11 A design

**Dimensional range:** Ø110 mm ÷ Ø320 mm (outer diameter)

### Technical References

Variable frequency drives (VFDs) on AC and DC motors create harmful electrical voltages on the motor shaft. If these voltages build up high enough, they will discharge through the motor's bearings, causing fusion craters, severe pitting, and fluting. Excessive bearing noise and eventually bearing failure is the result.

A much more economical solution is to provide for the use of current-insulated bearings during the planning stage. This reduces maintenance and repair costs, and increases machine availability all of which means greater value for the customer.

In principle, electrically-insulated bearings can be of any type. Most common bearing types include cylindrical roller bearings and deep groove ball bearings with outside diameters larger than 50 mm for traction motor designs, stationary electric motors (medium and large types), generators and special applications including submersible pumps. Also electrically-insulated taper roller bearings could be used as wheel bearings for tram and suspension tube bearings for electric railway vehicles.

Technical Characteristics of URB Electrically Insulated Bearings:

- ISO standard dimensions and tolerances
- Interchangeability with non-insulated bearing types
- Load ratings (i.e. both static and dynamic) are equal to the conventional standard bearings
- Dielectric breakdown voltage optional up to 500V or 1,000V.
- Coating thickness of about 0.1 mm
- Mounting and dismounting are the same as for the standard bearings
- High thermal stability

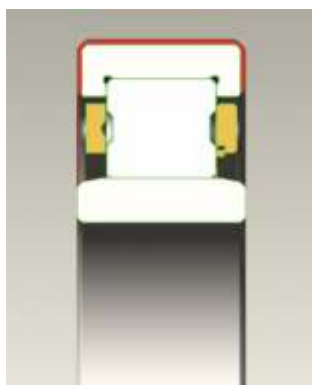


We specialize in manufacturing high quality key industrial parts with coating spray technology, among which the insulated bearing is our core product. We have of experience and know-how in bearing insulation using high-end plasma spray technology making excellent insulated coating on outer ring or inner ring at the customer's request. We are pleased to supply you our SQ11 & SQ11 A series cylindrical roller insulated bearing.

### Type of Insulated Cylindrical Roller Bearings, single row

Designation	Dimensions			Basic radial load		Speed limit	
	d	D	B	C <sub>r</sub>	C <sub>or</sub>	grease	oil
	mm			kN		min -1	
NU310 EMASQ11, SQ11 A	50	110	27	110	114	5300	6300
NU310 ETNSQ11, SQ11 A	50	110	27	110	114	5300	6300
NU311 ETNSQ11, SQ11 A	55	120	29	134	140	5000	6000
N411 MSQ11, SQ11 A	55	140	33	140	137	4300	5000
NU212 EBM6C4SQ11, SQ11 A	60	110	22	95	104	5600	6700
NJ312 EM6C3SQ11, SQ11 A	60	130	31	150	156	4500	5300
NJ312 EM6C3SQ11, SQ11 A+HJ312 ESQ1	60	130	31	150	156	4500	5300
NU312 EM6SQ11, SQ11 A	60	130	31	150	156	4500	5300
NJ213 EM6SQ11, SQ11 A	65	120	23	108	120	5300	6300
NU213 EM6SQ11, SQ11 A	65	120	23	108	120	5300	6300
NU214 EMC4SQ11, SQ11 A	70	125	24	120	137	5000	6000
NJ314 EM6C4SQ11, SQ11 A+HJ314 ESQ1	70	150	35	205	222	4000	4800
NJ314 EM6C4SQ11, SQ11 A	70	150	35	205	222	4000	4800
NU314 EM6SQ11, SQ11 A	70	150	35	205	222	4000	4800
NJ2314 MC3SQ11, SQ11 A	70	150	51	275	325	3800	4500
NU215 ESQ11, SQ11 A	75	130	25	132	156	4800	5600
NJ315 EMSQ11, SQ11 A	75	160	37	240	265	4000	4800
NU315 EMSQ11, SQ11 A	75	160	37	240	265	4000	4800
NU216 EMSQ11, SQ11 A	80	140	26	140	170	4300	5000
NJ2316 EMA6P5SQ11, SQ11 A	80	170	58	352	424	3600	4300
NU217 EMSQ11, SQ11 A	75	160	37	240	265	4000	4800
NU217 EMASQ11, SQ11 A	75	160	37	240	265	4000	4800
NJ417 MSQ11, SQ11 A + HJ417 SQ1	85	210	52	357	384	2800	3400
NUP417 MSQ11, SQ11 A	85	210	52	357	384	2800	3400
NJ2317 EMA6BP54SQ11, SQ11 A	85	180	60	367	444	3400	4000
NJ318 EMC4SQ11, SQ11 A +HJ318 ESQ1	90	190	43	315	345	3200	3800
NJ318 EMSQ11, SQ11 A	90	190	43	315	345	3200	3800
NU418 BMC4SQ11, SQ11 A	90	225	54	393	427	2800	3400
NU2218 EMASQ11, SQ11 A	90	160	40	240	315	3200	3800
NUP2218 EMASQ11, SQ11 A	90	160	40	240	315	3200	3800
NU419 MSQ11, SQ11 A	95	240	55	415	465	2400	3000
N220 EMSQ11, SQ11 A	100	180	34	251	305	3200	3800

NJ320 EMC4SQ11, SQ11 A +HJ320 ESQ1	100	215	47	380	425	3000	3600
NJ320 EMC4SQ11, SQ11 A +HJ320 ESQ1	100	215	47	380	425	3000	3600
NU420 MSQ11, SQ11 A	100	250	58	440	490	2400	3000
NF2220 EMC3SQ11, SQ11 A	100	180	46	335	440	3000	3800
NU2220 EMSQ11, SQ11 A	100	180	46	335	440	3000	3800
NJ2320 EMSQ11, SQ11 A +NJP2320 EMSQ1	100	215	73	570	720	2600	3200
NU221 EM6P6SQ11, SQ11 A	105	190	36	260	320	3000	3600
NUP221 EM6P6SQ11, SQ11 A	105	190	36	260	320	3000	3600
NU321 EMSQ11, SQ11 A	105	225	49	335	380	2600	3200
NJ322 EMC4SQ11, SQ11 A +HJ322 ESQ1	110	240	50	443	513	2400	3000
NJ322 EMAC4SQ11, SQ11 A +HJ322 ESQ1	110	240	50	443	513	2400	3000
NU322 EM6SQ11, SQ11 A	110	240	50	443	513	2400	3000
NU322 EM6SQ11, SQ11 A	110	240	50	443	513	2400	3000
NJ422 MSQ11, SQ11 A	110	280	65	583	672	2200	2800
NU424 MC4SQ11, SQ11 A	120	310	72	670	780	1800	2200
NU226 EMSQ11, SQ11 A	130	230	40	360	450	2400	3000
NU326 EM6SQ11, SQ11 A	130	280	58	570	670	2000	2600
NU326 EMASQ11, SQ11 A	130	280	58	570	670	2000	2600
NJ2326 MC4SQ11, SQ11 A +NUJ2326 MC4SQ1	130	280	93	915	1220	1900	2400
NU2326 EMSQ11, SQ11 A	130	280	93	915	1220	1900	2400
NU328 EM6SQ11, SQ11 A	140	300	62	670	800	1900	2400
NU328 MC4SQ11, SQ11 A	140	300	62	670	800	1900	2400
NUP230 EMC4SQ11, SQ11 A	150	270	45	440	585	2200	2800
NJ330 MC4SQ11, SQ11 A +HJ330 SQ1	150	320	65	800	1000	1800	2200
NU330 EMASQ11, SQ11 A	150	320	65	800	1000	1800	2200
NU330 MAC4SQ11, SQ11 A	150	320	65	800	1000	1800	2200
NU330 MSQ11, SQ11 A	150	320	65	800	1000	1800	2200



**SQ11 – outer ring coated**



**SQ11 A – inner ring coated**

### The Coating Process

The plasma spraying process involves generating an arc between two electrodes to ionize a noble gas that is issued from the plasma torch. The resulting plasma jet is used to carry the injected aluminum oxide powder. This powder is melted by the heat and sprayed at high speed onto the outer ring. When applied in this manner, the oxide layer adheres extremely well to the base material. It is then sealed and ground to size. This unique technology has the following benefits:

- **Plasma spraying** is the most versatile thermal coating process it produces high-performance coatings that deliver durability and reliability.
- The process applies coatings by injecting aluminum oxide powder into a high temperature gas stream. The plasma gas heats the powdered coating material to a molten state and sprays it onto substrates at high speeds.
- Plasma spraying is extremely flexible and is ideal for producing a wide variety of functional coatings.

Code Name	SQ11 for outer ring SQ11 A for inner ring
Puncture Voltage	500 ÷ 1000V
Insulation Resistance	>100 MΩ
Coating Thickness	0.10 ÷ 0.11 mm
Operating Environment	Dry, Damp
Bearings Size	50 ÷ 150 mm
Coatings Location	Outer ring or inner ring at the customer's request.

## Application, Advantages

### Different industrial applications

#### Application Examples

- Electric Motors
- Generators
- Railway Axle Box Bearings
- Traction Motors
- Wind Turbine

#### Advantages

- Insulated bearings prevent damage caused by electrical current
- Efficiency cost due to increased bearing life
- Fully interchangeable with standard bearings
- Easy assembly
- High operational safety
- Thermal conductivity between bearing and housing remains unaffected
- No additional design measures necessary



## Mounting precaution

- In order to prevent the leakage by electrical current on the bearing surfaces, strictly follow the mounting dimensions given in the size tables for the required shoulder height.
- Do not hit the bearing with the hammer during the mounting operation
- Excessive shock can damage the insulating layer of the insulated bearing, possibly resulting in electrical pitting.

## Expert advice and software designed for different applications

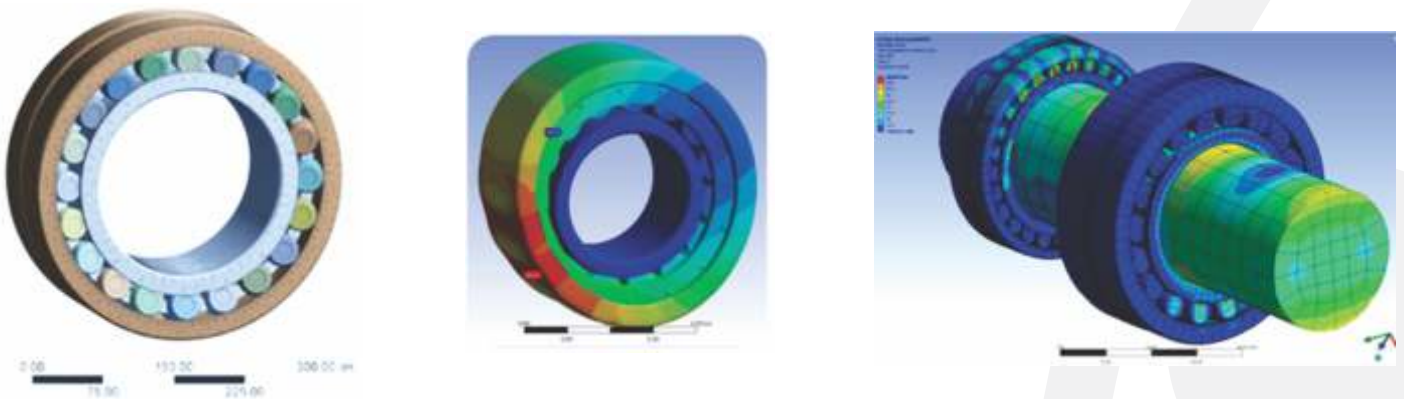
### 3D Modeling

Workgroup based, interactive designing in 3D visualization



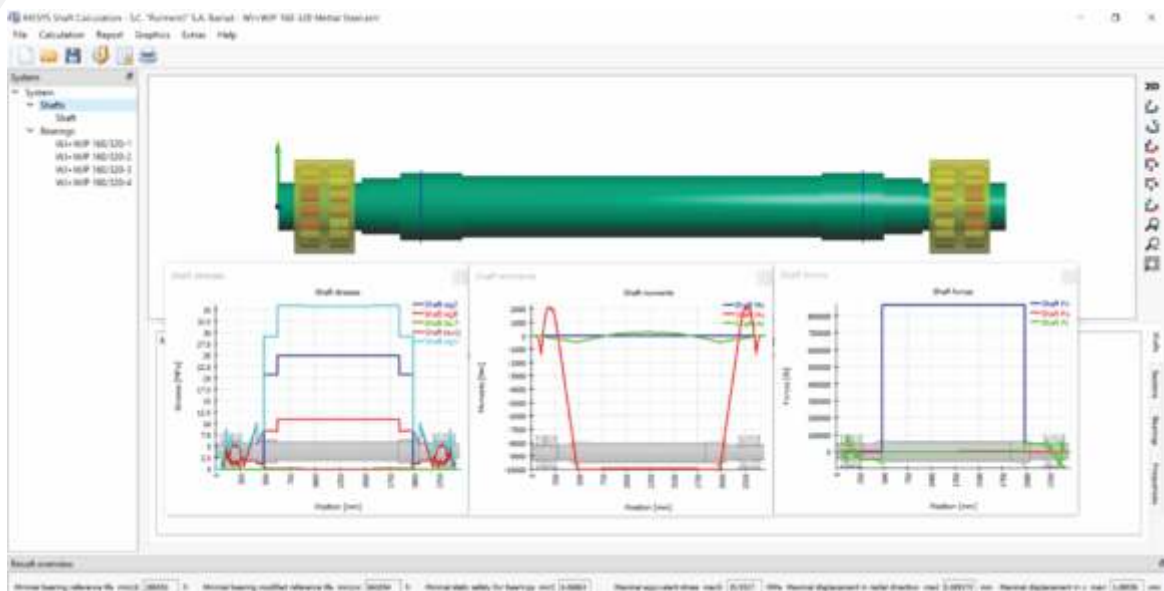
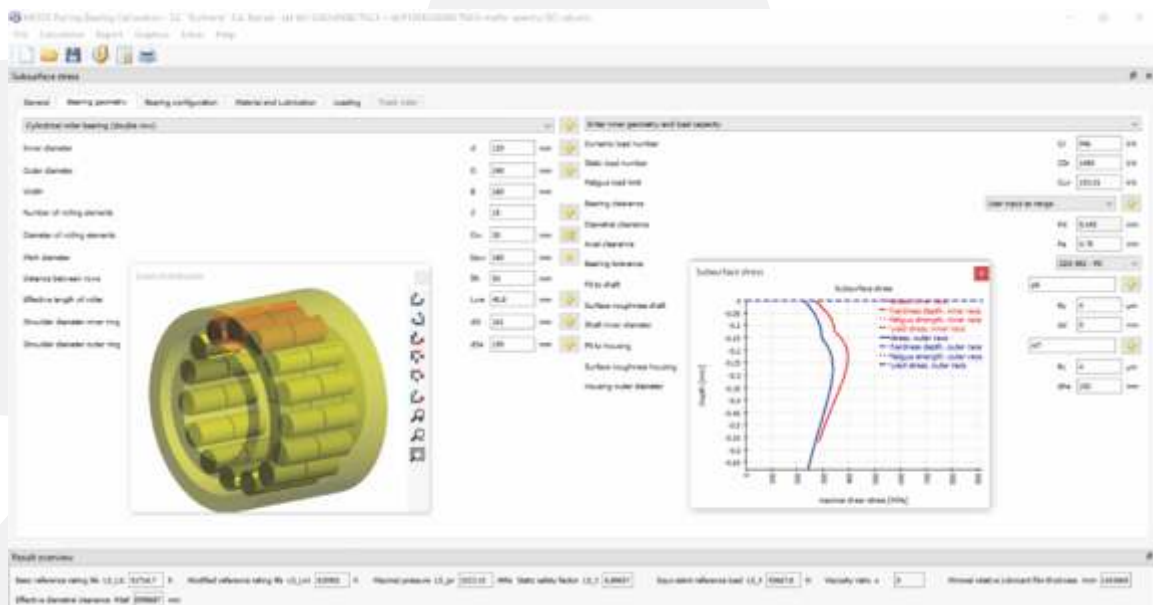
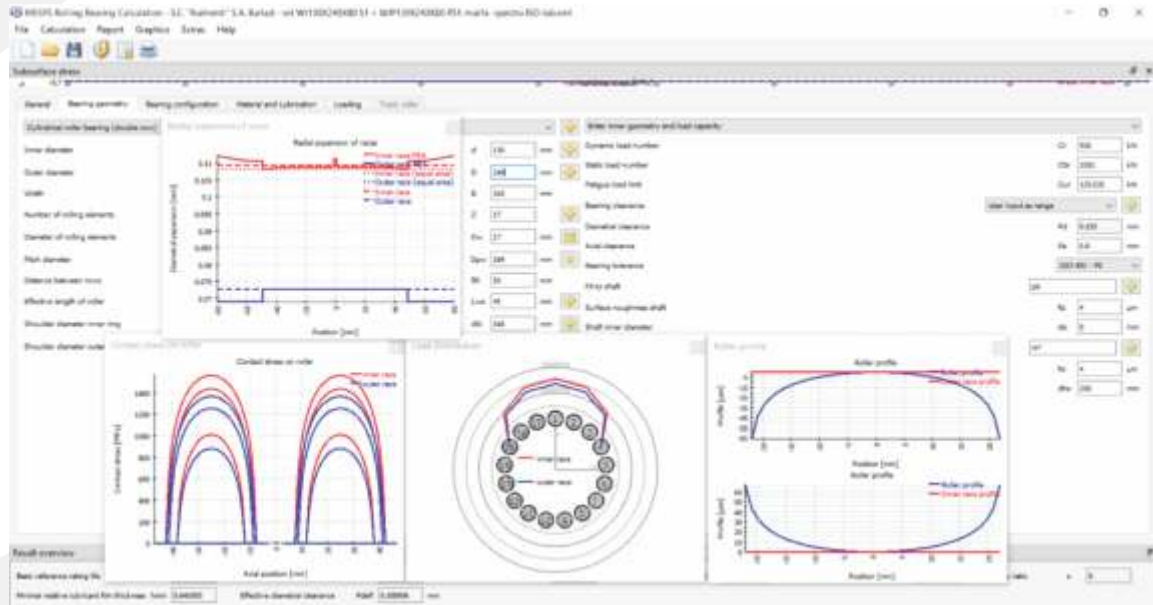
### FEA - Analysis

Finite element tool for structural analysis, including linear and nonlinear studies



## Rolling Calculation and Shaft Calculation

URB Company uses computer programs with finite element simulation taking into account internal bearing geometry and operating conditions.



RULMENTI Barlad has a long tradition in manufacturing of rolling bearings for more than 60 years, being one of the leading bearings manufacturers in Central and South Eastern Europe.

The key to success has been a consistent focus on maintaining the high quality of our products and services and investing in product development.

Our fundamental principles include respect for customers and meeting their needs. Therefore, we respond to market demands, offering, besides standard bearings and sizes, a wide range of non-standard bearings that are specific to various applications.

